Oral History Interview with

JoAnne Yates

29th March, 2021

Via Zoom

Conducted by William Aspray

Charles Babbage Institute

Abstract: The interview provides an overview of Yates's early life, education, and career. She discusses various people, including Alfred D. Chandler, who had a shaping influence on her career. Much of the interview discusses her career at MIT as a faculty member and administrator, and her research on the historical and contemporary study of organizations, including her collaborations with her husband, the political scientist Craig Murphy, and with the organizational studies scholar Wanda Orlikowski. She discusses the connections of her work to the history of computing and makes various comments about the development of the history of computing field.

Keywords: JoAnne Yates, Alfred Chandler, Wanda Orlikowski, Craig Murphy, Steve Barley, MIT, communication studies, genre studies, organizational studies.

Aspray: Okay. Today is the 29th of March, 2021. This is an interview with JoAnne Yates. The interviewer is William Aspray. This interview is being done over Zoom. Let's begin by talking about your growing up, when and where you were born, what your parents did. If you had siblings, if there's something you want to say about that. Please go ahead.

Yates: Yeah. So, I was born in Wichita, Kansas – so Midwest – and was the third of four girls. My father was a consulting petroleum engineer. My mother during World War II had been a secretary and technical writer and worked with him at Sohio and then became a housewife when they got married after the war and had kids. I was good in high school; I was good at math and things like that. So, when I went off to college, I started out as a math-physics double major and I even tried a computer programming course. This is the early 1970s. I took a course in programming, thinking this could be interesting, but hated it because this was the day of the 80-column card. And you would only get one chance a day to run your stack of cards. If you made a mistake in punching that, you had to start all over again, you had to wait a whole day. So, I quickly turned away from that. I think I was the most career oriented of my sisters and the only one who had a real career. Well, my dad, like most people at that point in time and place, had sort of assumptions that were very gendered about what one does. But I think he did sort of want someone in the family to be an engineer. So, since none of my sisters was going to be that, at some point I think he wouldn't have minded me being an engineer, but that didn't happen. I went ahead and got a degree in English. I had actually had undergraduate degrees in both math and English, but I went on and got my PhD in English.

Aspray: Where had you gone to college and why did you choose that college?
Yates: I went to TCU, Texas Christian University, mostly because my parents didn't want me to go too far from home and they had—I was one of four kids, so I wasn't going to get a whole lot of help with college and my parents wouldn't sign those forms that you needed to sign to get financial aid. And they probably wouldn't have gotten it anyway. So, TCU had merit-based scholarships at that point, and that's basically the reason. It was within this sort of radius of Wichita. They certainly didn't want me going to the terrible East, which was the terrible liberal East, et cetera. So, you know, it was a very conservative Kansas kind of background. You kind of see what was acceptable to them. And I got a scholarship, a full ride at TCU. So, that's where I started

Aspray: Did you find it a good place to go to college?

Yates: Not really. My husband went to Grinnell, and when I hear him talk about Grinnell in Iowa, I think that's where I should have gone, you know, someplace like that. A small liberal arts college would have been, I think, a much better place. I think you know; Texas sorority girls were not my thing. So yeah, it wasn't a great fit [culturally, though I got a reasonable college education].

Aspray: While you were going through college, did you have any ideas about what you were going to do for a career?

Yates: I was sure I was going to go on to graduate school. I mean, I did very well in college and was clearly on the graduate school track. The question was what field I would go to graduate school in. Originally, the idea was math, but then ultimately, I switched to English, and went to the University of North Carolina to get a degree in American literature.

Aspray: Why do you go there?

Yates: It was recommended by one of my favorite professors, who was actually a history professor, not an English professor. I had a minor in history too, and this professor, [who had gone there himself], said I should definitely look into it. When I looked into it and asked other faculty about it, some of them thought it was a good idea, too. [It was a particularly good school for studying American Literature. So, I decided to go there.] This was in an era when, I think for better or for worse, we reflected much less about those choices than young people do today. [It turned out to be a good choice for me.]

Aspray: Were there people in your life either before college or during college or during graduate school who were shaping influences on you?

Yates: My dissertation director at North Carolina, Hugh Holman, was a very historically oriented American literature professor and also much more open-minded towards different types of options [than most English professors]. I got out of that doctoral education in 1980. I got my PhD in 1980, which was a terrible year for people with English degrees. That whole era was a terrible era. Most people in English departments sort of said, you either had to get a job at a literature department or you were a failure. But when I went on the job market, I got only one offer. The primary interest in me from the job

market came around teaching technical writing, which I'd done a fair amount of. I was interviewed at MIT for such a job and had what I thought was a very good interview. Then I got a call back from them saying, “Well, look, we liked two of you who interviewed for this job teaching technical writing, but there's also this other job that's in the business school (MIT’s Sloan School of Management) to start a communications program.” Actually, it was conceived of as a writing program at that point in the business school. It's the kind of thing that most people in humanities departments have a knee-jerk reaction to even the notion of a business school. But Hugh Holman did not. He was much more down to earth and sensible about these things. He said I should go back and talk to them again. And I did go back and talk to a different committee who was hiring for this job in the business school and I ended up getting the offer for that and I took it. That was, in a way, a surprising place for me to be going – to a business school. The other thing that was interesting about it was that initially it was set up that I would be doing all my teaching in the business school, but my appointment would be in the writing program, in the school of humanities, which does play a very, very big role in what I ended up doing from that point on.

Aspray: A couple of follow-up questions. First, was your father happy? You ended up at MIT, that's close to being an engineer.

Yates: So, he wasn't happy that I got an English degree, but at least I was going to MIT. Yes. I mean, he didn't like it being in a Northeast city, but MIT was an engineering school. So yeah, that helped.

Aspray: The other question was about your dissertation. What was the topic?

Yates: Ah, this ends up being relevant as well, but not so much to the history of computing, but to my first book. My dissertation looked at the genre of Gothicism and how that genre—it started out as a British genre and Continental genre, but when it moved to America, to the new world, the whole set of implications was flipped on its head. So, in British fiction, the villains were either noblemen or people in the religious hierarchy, and the good people were natural people, close to the earth, et cetera; whereas in America, when it moved over to America, it was the flip of that, which is that civilization was good and protected you, and what was bad was nature, wild animals and Indians, as they called them then. I was looking at how a genre changed when it moved. I analyzed nine different novels written before the Civil War, looking at that issue. Genre was really at the heart of what I studied—a particular genre—and genre ended up being my path forward in part, as well.

Aspray: Okay. Given that you spent your entire career at MIT, could you please speak at some length about the progression of your career there?

Yates: Yeah, it was complicated. It was messy. As I said, I started on a tenure track in the school of humanities but teaching at Sloan. The summer before when I was going to come up for my fourth-year review, which is the first external review, the dean of the school of humanities had [been replaced by someone else], as had the associate dean at Sloan, who made the original agreement with the person in humanities. Humanities then said, "This makes no sense. Why are we bringing her up for promotion here in this school [the School of Humanities, Arts, and Social Sciences], since, if Sloan decides it doesn't like her and doesn't want to pay her anymore, then we'd have to pay for her and find things for her to teach. And what she's doing in research is a little weird." Let me backtrack and tell that story too, but I'll come back to that in a second. So, at that point, the two deans, well, basically the dean of the school of humanities, said, "You know, this makes no sense. We don't want her on the tenure track here; you take her on the tenure track over at Sloan, at the business school." But, the business school said, "That's why we did this in the first place. We don't see this as a tenurable field." So, I moved over to Sloan, but as a lecturer and later as a senior lecturer. So, I was paid a lot more than I had been at the school of humanities but was off the tenure track for seven years, ultimately, before my first book came out and a set of events happened. But before I go into that, let me go back to what happened, how I started into my work, the work that I chose. At the time when I started working on my first book, I was on an appointment in the school of humanities and I was teaching in a business school. So, I had to try to figure out what kind of research could I do that would make sense to both sides. After a lot of thought, I settled on looking at the history of the genres of business communication and how those had evolved over time. Chandler's work, Alfred D. Chandler Jr's work on the history of business, was very well respected even in the business school, even though it was history, very well respected. So that kind of provided an initial framework for me. So, I went inside that framework and started looking at communication inside firms: what happened to the communication and the genres of communication within business organizations. That was the impetus that got me going on *Control Through Communication*. Now, let me stop here for a minute again and ask you, would you rather that I go back to the career progression at MIT or back to the intellectual story, you know, the book and so on.

Aspray: I want to hear both, I'd be happy to have you do it in whichever way you want, but one follow up question. Did you get to know Al Chandler?

Yates: Yes, I definitely did. Reasonably well, ultimately. [He was very helpful to me professionally and very nice to me personally.] Let me give you the shortened version of the MIT trajectory, and then come back to what I think is of more interest to you, which is the work and how that first book, and then the second book, evolved. The rest of the trajectory is that after seven years off the tenure track, my book [*Control through Communication*] came out, won some awards, and was well reviewed. I had started work on my second project or was at least thinking about that. My husband was offered a job at a different school in Syracuse, and Syracuse of course had an information school. So, I was going to go talk to the information school. And I basically told my dean at Sloan, I want to be back on the tenure track. I wanted to be tenured. And if I'm not going to get tenured here, I'm going to go look at this job opportunity. So, he agreed to bring me up for review at Sloan. I was brought up and promoted to associate professor without tenure, and then given four more years before the tenure point; and then I did get tenured ultimately within Sloan. It was very tricky because at that point I did add to my historical work. I added some contemporary work with Wanda Orlikowski in the information technology (IT) area. That helped a little bit, I think. Basically, I did eventually get through, and I ultimately got promoted to full. I continued on. I did a few small administrative things and of course I expanded the program that I started out to create and did a lot of administration around that, and teaching. Then I guess in 2006, I was asked to be deputy dean, which was pretty surprising in one way, but not in another. I was the first female deputy dean, the first female faculty dean at Sloan. And, as the person who asked me to serve put it, if I didn't say yes, it was going to be another man. So, I had my arm twisted a little bit, but I did become a deputy dean for five years. And then, I spent a year at the Center for Advanced Study in the Behavioral Sciences at Stanford to decompress from that deaning, and then went back to Sloan and finished out. I'm now, I've now retired to a position called professor post tenure, which means I can still do a tiny amount of teaching, and I can continue to be a principal investigator, which I am, on a study that's irrelevant to all this. So, that's where I am now.

Aspray: So, one follow-up question here. I don't know the culture in the Sloan school very well, but at many business schools there's a very narrow set of publication venues and types of publication that are, are regarded as relevant. How generous were your colleagues about this issue? How open-minded were your colleagues about the kinds of things in the venues you publish?

Yates: Yeah, yeah. It was a point of contention, indeed a huge point of contention, but some of my colleagues were very open to a book as a unit of publication that they could see as a major piece of your portfolio. They didn't accept particularly the articles I had published in the Journal of Business Communication or in the archival journal or the business history – well, a little more business history, but not the other ones, nothing in communication would they really accept; but the book, they would accept, and then I published with my coauthor in management journals. Actually, from early on, we did get something accepted early in the nineties in the *Academy of Management Review*, which was a very well-respected journal. And then, we also got something, we published in *Administrative Science Quarterly (ASQ)*, which at Sloan is the top journal for anyone who's doing [work in management areas that don't center on economics or operations research]. You know, if you're doing anything that has to do with organizations and not just with math, *ASQ* is the top journal. So, the fact that we got a piece published in there before the tenure case was very helpful. The book, they were willing to weigh the book, and those management publications. When I came up for tenure, they were willing to have business historians review me as well as [people from business schools who worked at the intersection of information technology and contemporary organizations], but not to have people from communication review me, which was where I was sort of coming from originally. So yeah, it was tricky.

Aspray: Okay. And how did your faculty colleagues view you as a colleague? Where did they feel like you were doing worthwhile [work]? Interesting kinds of research?

Yates: It varied hugely. Some of them, the junior faculty in general that I got to know who were on my same level, were much more open to it than some of the senior faculty. It depended on the person and the field they were in. Frankly, the economists were not so excited about my work, to put it mildly. Some of the people in organizations were more open to it and saw the point and thought it was important. So, it really varied hugely. And apparently, it was not an easy decision.

Aspray: How do you feel about having spent your entire career at one institution?

Yates: Hmm. Well, let me answer a different, but related question first. And that is how do I feel about being in a business school, as opposed to all the other places I could be? Being at a business school was fabulous for me because the thing about a business school, which most people in schools of humanities just don't get, is how completely interdisciplinary it is. And for me, I know that I did much better work, ultimately, at Sloan than I ever would have done in an English department. There is just no question in

my mind about that. The interdisciplinarity at that place and, and the stimulation of all those incredibly smart people around me were terrific. I really, really, loved it. I often say, if there's any other place, any other kind of department or school, I could imagine myself being in and doing good work in, the only other option would be information schools. But they didn't exist when I started out. And I didn't want to move at a later point. So, I became very attached to MIT. I'm the loyal type. So, in spite of going through all that, I was very loyal to MIT and still am. Not all business schools would have been as appropriate a place for me as MIT. MIT Sloan School is not like a more traditional business school in a large state university or Harvard Business School or Wharton or—Sloan is much smaller, and it's much more prone to hire people from disciplinary backgrounds rather than from, rather than people who got their degrees at other business schools. So, it's a much easier place for me to fit into in that way. We [Sloan] are part of MIT and in some ways. I think I fit well there in spite of it, even in spite of the English degree, having had that math degree as well. And yeah, MIT is a quirky place. I like it. So, I don't mind not having moved, I never wanted to move. I felt like there's so much institution-specific investment you put into things, that one can put into things, and that I did put into things, at MIT and I never wanted to leave.

Aspray: Okay. Did you have close ties with other parts of MIT with, I don't know, the humanities programs, the STS program, that sort of thing?

Yates: So, two of my very closest friends [are from the humanities at MIT]. One of them, Harriet Ritvo, was on the committee that hired me in the first place. She had an English PhD from Harvard and became a historian of human-animal relations. She got tenure in the school of humanities, in the writing program and the history department. So, yes, I had close ties there. And also, another of my closest friends, Deborah Fitzgerald, a historian of agriculture, was tenured in STS and was the dean of the school of humanities for a stretch, an overlapping period while I was a deputy dean of Sloan. I've also been on the committees of a couple of students in the graduate program in history, anthropology, and STS at MIT, maybe three or four, over the years. I've also been on committees of doctoral students in IT and organizations, or in organizations and IT – you can come at it from either perspective. So, yes, I have been involved with people in the other departments as well.

Aspray: Are there other things you want to say about the career path part of your story before we move to the more intellectual side of your story?

Yates: Well, I think it was more common for women in my era to have these weird paths, that weren't so straightforward. I mean, it sounds totally bizarre, but when I look at one of the women who was senior to me, she had a weird path too, and I think it was just more common with women then. I didn't have children, and that was also more common for women who were tenured at high-powered places. The senior woman who had the other weird path, she had kids first, and then went into academia. So, it was pretty hard to do all those things back then. This was—I started at MIT in 1980—so it was a pretty different world then than it is now. My role in administration, that's maybe the one other thing I can comment on. I think one thing I learned in terms of the administration at MIT and at Sloan is that there's a certain proportion of almost any faculty who really don't want to have to be administrators of anything and therefore avoid all of that. So, if you're even remotely competent and willing, you tend to keep progressing in those kinds of jobs just because they need that kind of talent. Even if that's not at all what you had in mind for yourself, or feel like you're good at, you ended up moving up a certain amount.

Aspray: And at least some people will see the value that you've provided in doing that kind of work.

Yates: Yes, I think that is correct. And I think that the economists and the finance folks respected me much more when I was dean, because I worked well with them.

Aspray: Okay. So, let's, let's change direction and talk about the intellectual path.

Yates: Let's do. So, let me go back to my first book, *Control through communication: The rise of system in American management*. So that was the project that came out of trying to figure out how I balanced the school of humanities and the management school. I started into it having read Chandler and thinking, "Wow, this is great!" I loved his stuff. So, I thought, okay, this is a neat framework within which to dive deep into the communication piece and to look at the genres of communication. That book had three deep dives into the archives on three different companies. It also had sections on three other aspects. First, the ideology of management, the systematic and scientific management movements and how that pushed the evolution of communication; second, the technologies that enabled the communication; and third, the genres of communication and how they changed over time. One thing I figured out at a certain point. I was interested in the technologies. I knew that was going to be important. I was thinking typewriters, though, at that point, and the telegraph, and what I learned relatively early on in part from spending time in the stacks at Harvard Business School's Baker Library is that there were all these books about filing, vertical filing. I asked myself, "What is this about?" And you

know, this is in the 1890s and 1900s and those shelves of, of books on filing. I thought, “Wow, that's really weird.” So finally, I started looking into them and it became clear to me that the technologies that were going to be relevant to my story were much less the typewriter and much more the reproduction and storage and retrieval technologies. So, I learned about pressbooks that made copies in bound volumes. I learned they were bound chronologically and couldn't be reorganized. Then I learned about the filing system and how that it made a huge difference when filing, vertical filing, was introduced at the 1893 World's Fair. It was a big deal, won a gold medal, and was very important. When I started doing the first of my three case studies and found discussion [in archival documents] about shifting to files, you know, it was even clearer. So, I, as I dug into the vertical filing thing, it immediately connected with things I would hear from my IT colleagues about storage and retrieval and things like that. So, it started resonating with information technology, technology concepts. And I started looking at it in a little bit more of those terms. I also realized, I also dug deeper into the systematic office management ideology and realized that that was really important as a driving force. It wasn't actually technology that was driving the changes that I was observing, since the technology often was available well before a particular use emerged. Technology was enabling it, but it was this ideology of systematization that was really driving it. Once I began to get a clear sense of that in my own head, I started seeing what the shape of the book was going to be. I knew what to look for in each company. And in my second and third case studies, as I went into those archives. My first case study, Scovill Manufacturing Company, its archives were at Harvard Business School's Baker Library. I purposely chose that so that I wouldn't have to travel for that first case study because I didn't know how long it would take and how much I would find, and things like that. So, I thought it would be useful to have a close by archive for that. I went on to Chicago, to the Newberry Library, to do a railroad because Chandler said that railroads were so central to this. So, I did the Illinois Central Railroad there. I spent part of a leave semester and a summer in the archives there. Then I went on to Hagley Museum and Library for the DuPont archives. I knew a fair amount about DuPont through Chandler's writing, so it seemed to make some sense to do that as the third one. When I finished the book and got it out, I gave some talks around Sloan and it was the IT people who were the most interested in the filing stuff. What particularly interested them was the fact that they could have access to documents, not just in the chronological order in which they were created, but by different categories such as subject or author. So, that really resonated with colleagues in IT. And as a result of a talk to the IT group, I got to know Wanda Orlikowski better. She was junior faculty in the IT group. She thought that was interesting, too. We started working on a paper together, which turned into our first paper in *Academy of Management Review* [the theory journal of the major

management professional association], in which we propose genres of organizational communication as a concept. If I weren't in a business school, it wouldn't have happened this way. But we wrote the original version of the paper, in which genre played a minor role, and sent it in. The response was one of those high risk revise-and-resubmit letters: “There's something in here that's interesting, but we're not sure you're going to be able to pull it out, but we'll give you one more chance.” The review pushed us in a good direction, which was towards genre, which was the thing I had studied in my dissertation and towards Wanda’s theoretical underpinnings, which were Anthony Giddens and structuration. So, we wedded those two together and that really got us going on that concept. That revised paper went through and got accepted. I continued to work with her on contemporary things that had to do with information technology adoption and use, mostly in communication technology. So, we did a study that came out in *ASQ* [*Administrative Science Quarterly*], where we analyzed a set of email messages generated by a distributed group of software designers who were trying to arrive at a standard for LISP, the AI [artificial intelligence] language. At that point, they were developing [what became known as] Common LISP. So, we got involved in that and then did a lot of different studies moving forward from that. But that, that started this sort of parallel path. I started then having a parallel research path. So, on the one hand I was moving forward with Wanda on that contemporary IT stuff. On the other hand, I was working on my next historical project. [On the historical path] I thought, “Well, I have to come forward in time.” One of the technologies I didn't look at all was punch card technologies. I ended my first book in 1920. So, I didn't get into punch card stuff at all in it, but I ran into a little of it in journals at the time. And I thought, “Well, maybe I should look at punch card technology next, during the 20th century, at the use of that, and then how that led into computer technology.” So, that led to my second book, *Structuring the Information Age*, about life insurance and technology. So, I chose life insurance, I wanted to look at how *a business user industry* adopted and used the technology because everything that I heard on computer history at the Business History Conferences and the Society for the History of Technology looked at what was happening on the computer industry front itself, you know, IBM and the various companies around it. But I wanted to look at the firms who were user companies because I was a business historian. So, I wanted to know how businesses used them. I picked insurance as my user industry because I wanted an information-intensive industry. I didn't really want banking because there'd been a little work on that already. And I was pretty sure I didn't want to know that much about banking. but I thought insurance sounded a little [more accessible]. You know, it had math in it. And I could probably deal with that. So, I picked insurance as my user industry, and that's how I got into the work on my second book.

Aspray: Before we go on and talk in more detail about that, let me ask you a few background questions about your first book. It received awards from several different professions, academic professions. Can you talk to me about what it was that each of those professions found valuable?

Yates: Yeah, one of the awards was from the Society of Archivists. They thought it was interesting because it made sense of the archives. It made sense of different types of, series of, documents in their records. They took seriously how firms organized them. And you know, for example, in the railroad, records for the Illinois Central, one of the ways I discovered where certain break points were, was by going through series of documents that were all one series, and literally looking at them physically and seeing when their physical form changed. When their format changed, and so on. For archivists, I was digging into the nature of the records they collected if they were collecting business archives. So that's why the archivists liked it a lot. They, they really thought this was neat stuff because it was about what they worked with. I got an award from the business communication world because it showed for them, the interest was the genres of business communication: where they came from, how the memo developed from the business letter. I mean, that's something no one had really looked at. And how some of the reports and so on evolved. So, they were very interested in that sort of history of genres of business communication. So that's why they were interested. Then the business historians, I got the mid-career award basically on that book. It's interesting. I think I opened up a sort of way of looking at things that people hadn't done before in looking at businesses. They had tended to look either at very top management – at the very top and the strategic decisions they make – or there was a period when they were getting into social history. So, they were looking at labor and people down on the lower levels. So, you had the top of the pyramid and the bottom of the pyramid being looked at, but I was in here in the middle, and I was dealing with how did they actually get the work done in the office? What were the modes of communication that were enabling it? The systematic management issue was really important, and so on. So, I think it was having a very different sort of angle, that kind of broke out something a little bit different from what they had been looking at before. Chandler looked at the top of the hierarchy, and then there were the people that were down there at the bottom, but I, you know, was in here in the middle, where all this stuff was going on. This was an era when people like David Noble were major figures in this field. My take on David Noble's work at that point was that I felt like he completely missed middle-management. He had no clue about middle-management. He just saw firms as composed of two things (management and laborers), and management oppressed labor. But you see these middle managers caught in the middle and how they were working between the two and

sometimes under pressure from both sides. So, I think it was just a different way of looking at a different piece of it that people found interesting.

Aspray: Can you tell me about people who built upon your work in that first book, subsequent research by others, for example?

Yates: Well, there were a few people who looked at very specific topics. I think it's Craig Robertson, who wrote on the filing revolution, wrote a whole book on that, but followed up on my work. I think people in general got more interested in information and communication within the managerial hierarchy. I think that other people picked up on it, but not so much in following it directly, but in taking that perspective into all kinds of other areas. So, I don't know that there were so many direct follow-ups of it as there were people who took a little bit of that perspective and it came into their work. And people in information schools, I think, probably in some ways picked up on it as well, not just business historians. It was actually taught in and is still taught in some information schools. So, you know, it sort of surprised me with it gaining this sort of life of its own in some different fields.

Aspray: Yes. When I was teaching in the Texas information school in the early 2010s, David Gracy who was a very distinguished archivist who had a PhD in history, was teaching your book in both his archival courses and in his history courses.

Yates: Yeah, that's neat. I didn't know about that one. I know that the University of Michigan information school, John King, who also studied contemporary information technology. So I knew him from the Academy of Management and from that world, but he taught my book every year. Well into the 2000s, he would occasionally have me Skype into his classroom to talk about it. So, I think it had its longest afterlife in the information schools. Yeah. There was some follow-up on it by people who were in humanities departments, too, I think, but I don't know those as well. Since I wrote my book, there's been a lot of stuff that's looking more specifically at communication and information and their flows in in real-world kinds of organizations.

Aspray: Okay. Well then let's move back to the second book. Why don't you tell that story more generally?

Yates: What I was interested in was this user angle on information technology, rather than the producer angle, which was much better studied at that point. That was the point when I started to get involved a

little bit more with computer historians because I joined SIGCIS, which is the group within SHOT that looks at the history of computing. That's where I started connecting there with people like Thomas Haigh [head of SIGCIS at the time] and folks like that. Let me back up and say one more thing about the first book that connects with this second one. So another place that there was a connection with that first book, is I got to know Martin Campbell Kelly, and through Martin, you—I believe it was through Martin, that I met you, Bill. So, you guys were much more legitimate computer historians. I mean, in some ways, Martin and I were doing very similar kinds of work when he was looking at [the history of] counting houses and things like that. There was, there was, a similarity in some of that, and he was connecting that directly to computers. He was in a computer science department and connecting that directly with—so that was a line of connection. I don't know that I influenced him. I think he was doing this stuff already. I think both of us influenced each other during a short period in there. But, you know, that's when I first started seeing the closeness of this early work to computer technology or another way in which I began to see the closeness of it. My connection with Martin also perhaps helped me in picking the user industry for the second book. It probably influenced me in picking insurance as my user industry—insurance, because Martin was looking at the Prudential Assurance Company (which is the British company, as opposed to Prudential Insurance, which is the American company, which I looked at as one of multiple firms). But he did work on Prudential Assurance. So, I'm sure that affected me. Also, because I knew from him and from that work, the extent to which you can look at the information flows and the storage and retrieval in the insurance industry. So, that probably helped shape the choice of insurance as well. Now, picking back up on the second book and looking at users, [user firms and industries, not individual end users]. I have a tendency to always start back and do a running start before I get to what I'm actually wanting to look at. So, what I thought I was going to be studying was the adoption of computers in the life insurance business, but I started with tabulators and ended up doing much more on that than I expected to. I found it fascinating, learning about the history of tabulating equipment and how involved insurance was with it from the very beginning – again, both with Hollerith and with Powers, who was the other manufacturer of this punch card machinery, the other one that lasted for any length of time in the US. So, I got into both of those, and it was fascinating to me the extent to which the insurance folks directly interacted with the tabulating industry and pushed them to add certain capabilities to their machinery. They had equipment displays at their conferences. The insurance people would go look at the equipment, and they would also try to influence their salespeople. So, the run-up to the adoption of computers turned out to have a fascinating amount of interaction between the insurance companies and the tabulating companies. That only increased as I

took it over the divide into early computers. By then, I had this, this theoretical, model in my head from Wanda Orlikowski—Giddens' structuration model—and the fact that there are always reciprocal interactions between a structure and independent action. You look for this mutual constitution of reality, in some sense. Indeed, I was finding that the insurance people were influencing the technologists and the technologists were influencing the insurance, both. I certainly felt that the people studying computers at that point had vastly underestimated the influence of business on computers. Everyone at that point was looking at government and how government influenced early computers, which obviously it did and it was a major thing, but no one was really looking at the other piece of that—commercial users' effect on computers. So, as I went along in the research, it became clear to me that I really had a story, not just about insurance and how computers affected the insurance industry, but about computers and how insurance affected them. And the fact that insurance really, really wanted an incremental path—they really didn't want a radical break between punch card tabulating equipment and computers. They wanted faster, but they didn't necessarily want different, qualitatively different. So, they're the ones who provided the market for, the impetus for creating the market for early quasi-computers like the IBM 650, and later the 1401. On the one hand you had the UNIVAC working, which was this humongous thing that had to be hoisted up through windows, up the sides of buildings and through windows. That was what people were thinking— that's what computers were, and there was all this incredible publicity about those huge, humongous machines. But on the other hand, a lot of the insurance companies really didn't want to try that; they wanted something much more like what they already had, and they didn't want to *buy* it. They didn't want to make it a capital investment. They wanted it to be rentable. And so, the IBM 650 became wildly successful in insurance. All these 650s were adopted. They were already very familiar with working with IBM. They rented all their tabulating equipment from IBM and they could send back the upper-end tabulating equipment and get the lowest end 650 computer equipment. And they would do that. So, they used the 650 to have a migration path, a very slow, easy migration path. I was also able to see (by looking at cost ratios) that the industry as a whole didn't really save any costs, but their costs rose until the mid-1970s. It was only around 1975 that that trend reversed for most of them. They started to bring the cost ratio down, which suggested that, although the cost ratio includes many things other than computers, that the incremental path didn't suddenly revolutionize their productivity.

Aspray: How was the book received?

Yates: I don't think it was as big a hit as the first one. It was less well-known. It seemed to interest a smaller segment of historians. Computer historians were interested, but it didn't have the breadth of appeal that *Control through Communication* did; it had a narrower audience and the computer historians were a major piece of that. It didn't have the level of afterlife that *Control through Communication* did. Although I've recently been asked to give a talk about it, in Germany, via Zoom. So not everyone has forgotten it. But I think it was really much narrower in its appeal, and I think that's different from either *Control through Communication* or the standards book that came out in 2019. I think I made it too narrow.

Aspray: Well, one might say that the second book covers an entire industry, whereas your three case studies in the first book were only at the firm level rather than at the industry level. So, in one respect at least, the second book is broader than the first book.

Yates: Yes. But I did still do some specific case studies of firms within the insurance industry. But I think in its appeal, it was narrower. Also, I've figured out that I've never been very good at publicizing my books and *Control through Communication* took off on its own. Whereas this one didn't, and I didn't really do enough to try to make it better known – something that I've tried to correct a bit in the standards book. The third book.

Aspray: I can imagine that the insurance book will have a long life because it will be a case study that lots of people will want to draw upon because you've so carefully looked at that case study and analyzed it.

Yates: Yeah. Well, I hope it is. I hope it is. And I mean, you're right. In one sense, it is broad. I felt like it was broad when I got into it, but this whole industry, dealing with essentially two whole industries, a user industry and the computer industry. I think the important thing out of it that some people in business history did take up and has been important—but they took it up from my presidential speech at BHC [Business History Conference], more than they took it up from the book—that is this whole notion that you have to look at users, you have to look at things from the point of view of user firms. You can't just look at business, at the point of view of who's producing what. You have to look at it from the other perspective as well. So, kind of shifting perspective; that shift, I think has had some impact. That came across. I think the place where people pick that up, and when they mention this user piece of

things, they usually mention the speech, the BHC presidential address, where I talked about the importance of users and looking at that. It's shorter and not as technical as the book.

Aspray: Right. So, do you want to talk about the ISO book?

Yates: Well, so let me talk about the, the standards project as a whole, and say a little about the ISO book, but mostly focused on *Engineering Rules*, for a couple of reasons, both of which I'll make clear to you. In around 2006, the insurance book came out in 2005, and I was of course figuring, trying to figure out what's the next project. My husband, Craig Murphy, who is an international relations professor at Wellesley College, has always been a historically oriented political scientist. So, we've said for decades that we should write a book together someday, and maybe we'd find a topic. I can't remember how it came up in the first place, but when the topic of standards came up, all of a sudden it really clicked from both perspectives for us. Craig studies things around a concept called *global governance*, which is looking at the mechanisms that help keep the global economy and society functioning and interacting. Some of those are inter-governmental, like the UN, but many aren't – and standards was a terrific example of something that was non-governmental. The private standards that we studied were non-governmental and were a really key piece of this global governance world. Up till that point, I'd just been an Americanist. So, you know, I didn't have this international scope, but Craig did. So, together, we could look at standards on a broader level; and standards are something that very much involve businesses and firms—it both affects them, and they are actors in it. So, you know, it just sort of clicked. We started in on that. We started doing the work on the early 20th century, late 19th and early 20th century piece of things. But in 2007 I went into the Dean's office at Sloan. And for five years I was there. I didn't do anything but administrative work. We had done two or three papers, early papers on standards stuff and looked at one of the heroes of that book, Charles Le Maistre, a British standardizer, so we were already starting the project. But then I kind of fell out of the whole thing. We had looked at that early. During that five years when I was principally an administrator, one of the years Craig had a sabbatical at the Radcliffe Institute. He had been asked by a friend of his, who was in charge of a series of books from Routledge–small books on international organizations. He asked Craig, could we write one on ISO? And he said, yes. And I said, "I can't, I'm overwhelmed here." So, even though that book has my name on it as well, and I did some of the research on the historical part of it, he actually wrote that book. It drew on our joint work in the historical part, not in the contemporary part. And that's really more his book than mine, but we had not given up the idea of doing what we saw as the more scholarly book on standards. So, when I came out of the Dean's office, we had put in a proposal to the Center for

Advanced Study in the Behavioral Sciences at Stanford to work on this. That's where we went the year after I got out of the Dean's office, and I went back to that project and immersed myself in that again. We finally pushed it through; that's what made for such a long gestation on that book because there was a five-year gap, essentially, where nothing happened. So, there was maybe one year of work and then nothing. And then in 2012 we picked it up again. Returning to computer history and standards, I ended up doing a case study for one chapter of that book, about a standards committee of the W3C, the World Wide Web Consortium, a standards body based at MIT. Right before I left to go out to California, I went over there and talked to the head of it, Jeff Jaffe, and said, "I really would like to follow one of your committees and sort of be an observer on it." And he said, fine. He hooked me up with a committee. It took a while. So, it wasn't until late in that semester after I was out in California before I was actually, before everything had gone through so I could actually access everything. But I then became part of that Committee [for almost 5 years]. I read all the emails, the millions of them that came through, and attended their biweekly phone meetings and attended two face-to-face meetings, which were out there in California in both cases. So, I used that as a case study, and initially this was intended to be one chapter that dealt with IETF, the Internet Engineering Task Force, and then W3C. But the chapter got too long, I had to split it apart. So, two of the nine chapters in the book—both of which were my chapters—were completely about computer-related things. One was about the history of the IETF as a standards body, the IETF and W3C in general, and then the second was a detailed case study of one committee as well. So, and electrical engineers were in the book a lot, too. Because even earlier I did a chapter on electrical engineers who worked on what was initially called radio frequency interference, to make standards so that microwaves wouldn't interfere with televisions and things like that. Later, it became called EMC or electromagnetic compatibility. It involved computers a lot. And it still does. I mean, the fact that we can have our cell phones next to our laptops, and both of them function, the EMC standardizers are the ones who make that possible. So, I was still keeping some interest in computers, I mean, that domain ended up being an important domain that we looked at in that book for looking at standards. The larger point, though, of the book is not really about history of computers or anything like that. It's really about the role, how important a role, standards play in our world today – in businesses and all kinds of other things. It turns out that, you know, first of all, our whole world wouldn't even function without standards. It's just like everything around us would not work. And standards—they can come from three sources: from the market and standards wars; from government (but governments don't, in general, like to set them); or from this whole big world in the middle of voluntary consensus standard setting. That's what we were studying. It's an incredibly important role in the world today. It's

engineers and businesspeople who are the people on those committees. And, you know, although many people will argue that that's a bad thing ("We, the government should make all the standards. We shouldn't let businesses have their hands in this."), it turns out the government doesn't have the expertise or the will to do it in most cases. And we really need the businesses to be doing this because if we didn't have this, we would not have the world of devices, for example, that we now all depend on. The Zoom wouldn't work, right?

Aspray: Okay. That book's not been out all that long, but can you tell me about its reception?

Yates: It's been interesting because it's gained some audiences, I had no idea of. Originally, we thought, historians of technology and business, and then possibly practitioners; and we are starting to get some, and we've gotten some practitioner interest and we're getting a little more. I gave a talk to the IETF recently on it, for example. But there's been another sort of realm that was interested in it that I never would have guessed: law. Who knew? I've never done anything around law, but when the book came out, someone who was a legal scholar contacted us, said she had seen Craig give a talk at [a conference on standards at] Northwestern on it. She asked if the book could be the subject of a symposium sponsored by the Yale Journal of Regulation, in which over two weeks—this is all online and asynchronous, but not video, all text—a series of 10 different legal scholars commented on it. That completely blew us away. It actually opened up to us a whole new sort of set of issues that we hadn't focused on. We were focused on industrial standards setting, and we didn't really look in the domain of safety standard setting, which had the closest connection with the legal world. So, fire prevention, for example, and setting standards that got put into municipal codes or state codes, which are mandated by those local levels of government, and sometimes even by standards. We learned about standards getting incorporated into federal law. There's a whole set of issues around that, that we're now trying to understand better and trying to write a paper on. So, it opened up a whole different area of standard setting to us and challenged this notion that we'd always seen voluntary standards as an alternative to regulations. It is in most of the industrial settings we were talking about, but in these safety-related things it's often incorporated into the law. So that really surprised us. So, there've been people in different areas that have had things to say—also engineering history, people who are interested in engineers. The title as you know, is *Engineering Rules*, and that has really caught the attention of some engineers and engineering historians. So, this is a case where I think even though most of the time it's been out, we've been under pandemic constrictions. Nevertheless, it has become better known by various groups, funny, like the legal scholars, by unexpected realms of scholars. Then the fact that,

engineers are interested. Like, when I gave a talk to the Boston area alumni association of MIT – of course, full of engineers – they were immensely interested. They really liked this idea of engineers being very important. For the talk for them, I emphasized the fact that we tend to lionize inventors, but in fact one set of heroes of modern technology are really the standardizers because, without them, all of this stuff wouldn't be working together. So, they liked that notion. So, it's gaining a very diverse and interesting audience. I've also done something that I've never done before, at the suggestion of colleagues, both historians and business school colleagues. But actually, it was the historians who really got me going. I got a Twitter handle and you know, started using it when, when it came out, to market the book. I posted the book on there, a picture of it, but the cover is, it's very engaging. Lots of people looked at it and paid attention. So, it's gotten some broader attention. It's not like a popular book, but it's gotten a broader exposure than *Structuring the Information Age* did, for which I did no marketing at all. So, I was trying to be a little bit better about that. Plans for a next book? No, at the moment I've decided that I really don't want to take on another book project. I am a very slow book writer. I guess the fastest one came out in nine years after it was conceived. I mean, endless research. I get caught in rat holes, going down them and so on. So, I've decided at this point, rather than doing another book-length project, that I want to focus more on article-length projects. At the moment, I'm still focusing on standards because the reactions to the book have raised all these new issues for me—looking at the safety piece of it, for example. I'm also editing a special issue of *Business History Review* on standards. So, there are more pieces of the standards puzzle to be studied. The standards puzzle feels to me much more generative and ongoing than the insurance and computing one. I feel like there's a lot of paths I can follow from it.

Aspray: I want to come back and ask you about some people from the history of computing. There are a number of people who are primarily business historians of computing, Steve Usselman, Lars Heide, Arthur Norberg, Shane Greenstein, Jeff Yost, Tom Haigh, Jim Cortada. Did you have connections with any of those people?

Yates: Yeah, I've had interactions with most of them. For example, Chandler and Cortada together edited a book on the information age, *A Nation Transformed by Information*, and I have a chapter in that. Of course, because I joined SIGCIS, I knew people there. Certainly, Tom Haigh I know through SIGCIS, and I know Jeffrey Yost [and Arthur Norberg] through CBI because I did research there at the Babbage Institute, when I was doing the insurance and computing book. So, I knew them through CBI

and definitely used some of their work and benefited from it. Shane Greenstein. I still occasionally, see him. He's in a business school though. So, in some ways that's it a nice complementarity, right?

Aspray: Steve Usselman?

Yates: Yeah, of course, but with regard to standards rather than computers. As a historian of standards, I certainly was influenced by one chapter in particular of *Regulating Railroad Innovation,* where he talks about an episode that we also talk about in the standards book. Absolutely. I thought that was relevant.

Aspray: The other person was Lars Heide, who, of course, is doing European work more than American.

Yates: Yeah, my feeling is that Steve Usselman did his work before I did mine, whereas Lars did his after I did mine. So, it's a different kind of relationship. I certainly know Lars and we have met up at conferences, but I wasn't influenced by his work. I think it was, if anything, the reverse, whereas I was affected by Steve Usselman's work and certainly Norberg helped in many ways when I was at the CBI. And then I'm certainly aware of all of Cortada's work. He has a very different style of producing books than I do. He's on a very different temporal scale, [publishing so many books so quickly]. So, in some ways I think we're less likely to influence each other, [though I certainly gleaned some important facts about IBM from his work]. I think your work has influenced me, and I have read yours and yours did influence me. Certainly, also Pugh and who else [authored those IBM history] books?

Aspray: Oh yeah. I've forgotten the name.

Yates: Yeah. But that book certainly was an important source for me on the 650.

Aspray: Did you, by any chance get to know the people at the Computer History Museum while it was still in Boston before?

Yates: I never did. I wish I had, but I never did. And during that year I was out in California, I was in touch with all these people from IETF and W3C, but not with the staff at the Computer History Museum. I went into the museum when I was out there. I mean, Craig and I've walked through it and enjoyed it and had a good time, but I never had any direct contact with them. I guess I don't really see myself as a computer historian, so I don't, I would have thought it presumptuous if I had tried to suggest that I might have anything other than the normal experience there. Although I guess I did have some

interaction with the Smithsonian folks on their Information Age exhibit decades ago, their first information age exhibit, with David Alison. I've even forgotten exactly what I did, but I did have some interaction with them.

Aspray: One of the nice things is you have a very interesting lens at which to look at the history of computing. Do you have any observations you care to make about the nature of this field and the way it's changed over time, interactions with adjacent fields, and so on?

Yates: Well, I think one of the things that's been important and that it's finally gotten past for the most part, is people who get fixated on firsts. And I think that's just a complete mistake, and or at least it's a rat hole that you go down forever. I think this is because I'm sitting in a business school. I think what's important is not who was the first to invent this thing, but who first got it to the market? Who first got it into use by people, by companies, etc.? I think there was a period in there – still some people, I guess, who get a little too fixated on that, on who was first on X, Y or Z, on who was first to invent something rather than on who actually brought it into use. In some ways I am a little ambivalent, and I have a little bit of that feeling even about [research on] Babbage because, Babbage didn't directly influence the modern computer, that's not where [the people who developed computers in the 1940s and 1950s] learned that stuff. It is a fascinating predecessor of it, but it didn't directly influence, the computer as it was made into a production item that could be bought by people in a real market. So, I think that's the business school piece that maybe affects me a lot. I guess I'm less interested in that; to me, who came first ends up coming across as a little bit like how many angels on the head of a pin. For me, what's more important is when did this make it into the business world? When was it a real product? When could it be used? As I think about that, I think that's clearly influenced by my sitting in a business school setting, that certainly has shaped my thinking. I probably wouldn't feel that way as much, but I do think that it's good to get beyond just the nitty gritty of the technology and into what it allowed people to do differently when they use it in the real world. I think that's the key issue.

Aspray: In the last decade or so there've been a lot more communication scholars, a lot more media studies scholars who are interested in computers and computer history. Does that somehow make the new lines for research closer to your interests in some kind of ways?

Yates: Yeah, so, so there's a set of people who study the influence of algorithms, and a lot of them are in business schools, but some of them are in STS or communications. And this whole notion of

algorithms and how they influence life in various ways, I think that's very consequential and yes, I think that's very interesting. If I were younger, I might want to go into some of those areas. There are even people in English departments who study algorithms and how they affect people. So, it's coming around full circle in a way that these issues around communication and media are definitely part of it. And you know, people who come at history of computing from different perspectives and different lenses tend to have different things they see in it and getting all of those out is great.

Aspray: Let me ask a very different question. Maybe a decade ago, I wrote a paper entitled "The Many Histories of Information" which was about different communities who were studying information in different ways. They didn't talk to one another very much. When I was reviewing your CV this morning, I was looking at the various journals that you had had involvement within various ways and information and organizations play a role together in a number of those journals. Is there a kind of organizational and management notion of information history, and where do people who are interested in those questions talk to each other, where do they publish their work? What are the main kinds of issues they ask about?

Yates: There's a whole lot of people in business schools, many of whom are in IT departments and some of whom are in organization areas. Some schools have gotten rid of their separate IT departments and folded these people into, for example, the organization area. They're very interested in what happens when organizations adopt and use various technologies. For example, do they affect surveillance on workers? What is the effect of that, and how do people push back? So, people look at that. There are a lot of organizations and technology scholars. There are a lot of people in the business school world who focus on that. That's, I guess, the world that I'm most in contact with at Sloan. When I go to seminars, I'm going to hear those people, not historians, for the most part. Let me back up and ask you your question again. What specifically did you ask me? I'm trying to decide if I answered or not.

Aspray: Well, there are archivists who talk about information history and there are librarian scholars who talk about information history and pretty clearly the kinds of questions that they raise are different. So, if you had organization and management scholars, what kinds of questions would they raise about information history?

Yates: Well, I mean, they, they raised questions about how information flows affect organizations, how they enable certain things to happen, how they constrain other things from happening. Some people

look at it from the efficiency point of view: how does this make things more efficient? Other people look at it from how does it affect the relations of different sets of employees. So, for example, I was a coauthor, one of four, on a paper about a pharmacy robot, the adoption of it, and how it served as a boundary object. A boundary object, [something—usually a physical object—that helps people talk across disciplinary or occupational boundaries,] is a concept that organizational people talk about. And how does the boundary object work to bridge between various occupations, and then how would it influence them. In that paper we inspected some of the boundaries, actually, between the sets of occupations because [the robot became a boundary object that] changed what people in one occupation were doing. So that kind of thing: looking at how this kind of technology affects an occupation. A very famous paper [on technology and occupations] was written in the 1980s by Steve Barley, who was at Stanford for most of his career. He actually was a graduate student at Sloan at MIT when I first went there; that's where he got his degree. He wrote a very famous paper about radiologists and technicians in a medical setting. It was about how, around the introduction of this new technology, there was a whole reconfiguration of occupational roles and knowledge, and who had the power, the knowledge that someone else needed. It really, really changed the organizational roles and processes. So, you know, it looks like this piece of technology, but in fact, it's completely central to the organization of the company and it changed that organization, though in different ways in different places. He studied two different sites and how it, how the organization changed around the new technology, and it was different in the two. And he studied reasons for that—what was different in the two settings that caused the organization to be different. So that's the kind of thing that people in organizations want to look at around technology and information: how does it affect organizations? There are people who want to look at the numerical and productivity kinds of things, but there's a set of qualitative researchers like Steve Barley and Wanda Orlikowski and others who do observation, close observation, ethnographic observation, to try to understand what happens when people interact with the different technology. There are people who are still doing that. They're looking at this issue in the case of geographically distributed teams. They will have people observing team members at three different geographic points, different people observing, and all of this gets put together finally, but how are the dispersed team members interacting? How is their communication working or not working so well? These are the kinds of things that organizational people ask in their studies. In some ways, I'm more familiar with that research than with all the different types of computer historians because I live among these types of scholars in a business school. And I go to seminars all the time about people looking at this stuff, and so on. So I've always got feet in different worlds and it probably gives me a different

perspective, sort of circles back to why I think being in a business school has been so valuable for me – the interdisciplinarity and the fact that people are coming at things from so many different points of view, all of which, you know, have lots to add.

Aspray: Are there topics that we haven't talked about that we should talk about?

Yates: You know, I think the best answer to that is to say, let me mull on that. And if I come up with anything, I will, I can send you an email and we can do an addition because what is likely to happen is that, you know, three hours later, something will pop into my head. Oh my God, I didn't mention X, right? One last notion. One last comment, though, is that for me, *information* is a very powerful, is more powerful than the computer. I think I study information more than I study computers *per se*, and what happens around it and information technology. And that technology isn't all just high-speed computers. [Or perhaps I should say I study the history of *communication and work*, not of computers. I'm interested not in the technology itself, but in what people do with or through the technology, and how people's communication or work is influenced, is shaped by how they use the technology. That is always the central part of the story for me.]